CLAIMS

What is claimed is:

1.   A method for grouping mobile entities, comprising:

defining a partitioning entity;

constructing an initial data structure that defines a plurality of cells occupied by said mobile entities;

for each cell, electing a coordinator from the set of mobile entities occupying that cell;

said coordinators cooperatively computing the costs associated with selectively subdividing and merging said cells and communicating said costs to said partitioning entity; and

said partitioning entity using said costs to generate a new partition scheme and communicating said new partition scheme to said mobile entities.

2.   The method of claim 1 further comprising:

associating a multicast group with each of said cells and using said multicast group to support communication among mobile entities within each cell.

3.   The method of claim 1 wherein said step of cooperatively computing comprises:

each coordinator computing a first cost associated with subdividing that coordinator's cell; and

using said quad-tree data structure to identify sibling relationships among said coordinators to define sibling coordinators; and

said sibling coordinators collectively computing a second cost associated with merging cells occupied by said sibling coordinators.

4.   The method of claim 1 further comprising:

associating a multicast group with each of said cells;

associating a vision domain with each of said entities; and

enabling said entities to selectively join at least one of said multicast groups based on said vision domain.

5.   The method of claim 1 further comprising associating a multicast group with each of said cells, allowing said entities to join at least one of said multicast groups and computing said costs by assessing the number of multicast groups said entities have joined.

6.   The method of claim 1 further comprising associating a multicast group with each of said cells and using said multicast groups to communicate said new partition scheme to said mobile entities.

7.   The method of claim 1 further wherein said partitioning entity generates said new partition scheme by dividing the one of said cells that gives the largest cost decrease.

8. A system for grouping mobile entities comprising:

a partitioning server;

said partitioning server defining a data structure having nodes corresponding to cells occupied by said mobile entities;

a plurality of client applications each associated with one of said mobile entities;

said client applications each having communication mechanism capable of communicating with the communication mechanism of other client applications and with said partitioning server; and

said client applications and said partitioning server being configured to establish a dynamic partition protocol whereby said quad-tree data structure is reconfigured based on the number of communicating entities within each of said cells.

9. The system of claim 8 wherein said client applications each have memory for storing a vision domain corresponding to a predefined area of interest and said communication mechanism of each of said client applications is configured to join in multicast group communication mobile entities in cells that overlap with said vision domain.

10. An information system according to claim 8 wherein said mobile entities are vehicles having position location equipment that generates vehicle

position data and wherein said client applications communicate said vehicle position data to other client applications associated with mobile entities occupying a common cell.